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Geographical Variation in the Pearl-spotted Owlet, *Glaucidium perlatum* (Vieillot)

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Though Erlanger (1904, p. 240-241) and van Someren (1922, p. 46) maintained that the geographical variation in *Glaucidium perlatum* necessitated the recognition of two or three races, other authors, such as Claude Grant (1915, p. 256) and Friedmann (1930, p. 300-302) reported no significant geographical variation and the general practice is to recognize no races.

A survey of the material in the Chicago Natural History Museum, augmented by the loan of material from the American Museum of Natural History through the kindness of Dr. J. P. Chapin and Dean Amadon, indicates considerable geographical variation in general tone of plumage. This has perhaps been obscured in part by the plumage differences in pattern due to age and by individual variation in pattern.

The young birds have the top of the head, and the back, with little or no spotting; the adult is conspicuously spotted. Erlanger (*loc. cit.*) had already considered this an age character, but he thought the spotted birds were the young. Grant (*loc. cit.*) rightly considered the unspotted birds the young, as Lynes demonstrated (1925, p. 391).

The shape of the markings on the head varies individually from spots in some individuals to bars in others. Both types may be found in one area, but the south African birds tend to have the spots widened into bars more often than do more northern birds.

Friedmann (*loc. cit.*) reports two color phases in this species, a gray and a rufous phase. In present material, there is variation from more gray to more brown in specimens from one general area, but it seems advisable to consider it simply individual variation around a mean. Kenya Colony specimens may be an exception, with rather gray and rather rufous birds repre-

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sented, but they do not come from the same part of Kenya and geographical variation also may play a part here.

The main variation correlated with geography is as follows: the birds from Abyssinia and the Anglo-Egyptian Sudan are dark; those from Senegal to Cameroons and Chad area are conspicuously pale with a tawny tinge; those from Transvaal, Bechuanaland, and South West Africa are pale and gray; the birds from east Africa are intermediate between the pale gray south African and the dark northeast African birds.

The range of this species is from northwest Africa, around (but not in) the forest, through east Africa, to the Orange River in South Africa. Three extremes of plumages are represented in different geographical areas. This does not represent a simple cline, and it seems that three subspecific names will be useful in discussing this variation.

The following three races are recognized:

1. *Glaucidium perlatum perlatum* (Vieillot)

Strix perlata Vieillot, 1817. Nouv. Dict. Hist. Nat., VII, p. 26. Type locality Senegal.

Diagnosis. A pale race, with a distinctly brownish tawny crown, a tawny tinge to back, and with conspicuous tawny in the collar.

Range. Senegal to northern Cameroons and Chad.

Remarks. The amount of variation in this series is not great. The four easternmost specimens, from Gold Coast, Nigeria, Cameroons, and Chad, fall within the range of variation of Senegal birds. Temminck's *Strix occipitalis* from Senegal and Gambia Rivers, in Planches Coloriées, plate 34, 1821, is a synonym. Alexander (1901, p. 10) described *Glaucidium albiventer* from Kwobia, Gold Coast (N. Terr.), and figured it in the *Ibis* for 1902 on plate 9. It was described as similar to *G. perlatum* but with very few dark markings on the underparts. Bannerman (1933, p. 29) has examined the type and while unable to match the type among the large series in the British Museum believes it is an abnormal specimen of this species. Our present specimen from Gold Coast hinterland does not show the characters described for *albiventer*, thus supporting Bannerman's conclusions, and *albiventer* is considered a synonym of *perlatum*.

Most of the adult specimens before me have the markings of the crown in the form of spots; but one, from Senegal, has the head markings widened into bars as much as in any specimen of the species I have seen.

Specimens in old, worn plumage are paler than birds in fresh plumage, but the incoming feathers in moulting birds indicate that the pale, tawny character set out for this race is not the result of wear.

Adult specimens examined 8: Senegal (3), Senegal-Gambia (1), Gold Coast, Gambaga (1), Nigeria, near Kano (1), Cameroons, near Marua (1), Chad, Logone River (1).

2. *Glaucidium perlatum kilimense* Reichenow

Glaucidium kilimense Reichenow, 1893, Ornith. Monatsb., p. 178. Kilimanjaro.

Diagnosis. Differs from *G. p. perlatum* in having the upperparts generally considerably darker and duller brownish in color, also the dark markings on the underside are considerably darker and duller brown.

Range. Anglo-Egyptian Sudan (Eretria probably), Abyssinia and northern Kenya southward, intergrading with the next race that lives in southern Africa.

Remarks. The present specimens assigned to this race combine series that differ from each other as well as some individuals that do not fit well into the series. The Abyssinia (3), the Sudan (2), and northern Kenya birds (Waso 1; Kerio River 1; Isiolo 1) are the darkest and duller, forming a fairly uniform series. Three Turkwell birds are equally dark, but with a rusty tinge more pronounced on the top of the head and foreback, and the markings on the breast more rusty-tinged. On casual inspection all these 11 birds are clearly separable, individually, from all the specimens of the preceding race.

Seven other birds from various parts of Kenya are more variable: 1 Simba and 1 Tsavo bird are rather dark and dull, rather close to the Abyssinia birds; three others, from Juba River (1), Tana River (1), and Simba (1), are paler and more rusty to tawny tinged, the palest, from Simba, being very similar to the darkest specimens of *G. p. perlatum* (one from Senegal, the other from the Gold Coast). The remaining two birds, one from Lake Magadi in south Masai, and the other from Mau-Njoro are pale and gray, and very similar to the darkest specimens from Bechuanaland. A Nyasaland specimen is very similar to the Lake Magadi specimen.

There seems little doubt that the North Kenya-Abyssinia-Sudan birds are distinct enough (100 per cent separable) to recognize as a subspecies. The inclusion of the other varying Kenya birds is less clear. Tendencies toward both other subspecies are evident. These differences have already been indicated in the literature, as when Friedmann (1930, p. 301) recorded Abyssinia skins as darker than Kenya specimens.

However, there is the question of the name *kilimense*. The type locality is Kilimanjaro from whence I have no specimens; presumably the population there is similar to that of nearby Kenya, and represents a variable population, some individuals with characters intermediate between Abyssinia birds and

south African birds, and also with specimens approaching *G. p. perlatum* in characters. But as these birds average dark the simplest solution is to allocate the name to the dark northeastern population and use it for this subspecies thus considered to extend to northern Tanganyika at least.

Ruppell (1835, p. 45) uses the name *Strix (Noctua) pusilla* (Lath.) based on Levaillant (1805, pl. 46) as the name for an owl from Sennaar. However, Daudin in 1800 also based *Strix pusilla* on Levaillant (pl. 46) and Hartert (1913, p. 1008) has shown that Daudin's name is a synonym of *Glaucidium p. passerinum* (Linnaeus), 1758. Thus Ruppell's name need not be considered.

Specimens examined: 18 adults (for localities see remarks).

3. *Glaucidium perlatum licua* (Lichtenstein)

Strix licua Lichtenstein, 1842, Verzeichnis Saug. u Vog. Kaffernal, p. 12. Vicinity of junction of Vaal and Orange Rivers.

Diagnosis. Similar to *G. p. perlatum* in being pale, but differing from it in being grayer, much less rusty brown on the top of head and neck; much less tawny in the back; less tawny bordering the nuchal collar, and less rusty in the dark markings below.

Differs from *G. p. kilimense* from Abyssinia, Sudan and northern Kenya (see above) in being much paler and grayer above.

Range. The southern and southwestern part of the range of the species. Our specimens are from South West Africa (1), Bechuanaland (5), Transvaal (1), and Nyasaland (1). This race intergrades with *G. p. kilimense*, presumably in Tanganyika Territory and southern Kenya.

Remarks. These eight specimens form a fairly uniform series, and all are separable on casual inspection from the specimens included in the subspecies *G. p. perlatum* of northwest Africa. They are also clearly separable from all the specimens included in *G. p. kilimense* from Sudan, Abyssinia; and Turkwell, Suk and northern frontier of Kenya. For intergradation in other parts of Kenya with *kilimense* see remarks under that race.

Since we do not have a copy of Lichtenstein's paper in the Chicago Natural History Museum, H. G. Deignan kindly sent me excerpts from it. The description seems to apply to this species. As to the locality from which the specimen came, the following is in the introduction to Lichtenstein's paper:

"Herr Ludwig Krebs hat auf seinen letzten Reisen die Gegenden im Nord-Osten der Capcolonie, um den Ligua-Flufs, jenseits der Bambus Berge besucht."

As Mr. Deignan pointed out to me, *licua* is evidently a latinized form of Ligua and would be obviously the restricted type locality. Though the

"Bambus Berge" appears to be the mountain just north of the Cradock-Queenstown area of Kafferland, where Krebs is known to have collected, and one would expect the Orange River just to the north to be the Liqua, I was unable to find the Liqua River on any map. However, Dr. Herbert Friedmann of the U. S. National Museum writes me that he has corresponded with C. J. Skead of the Kaffrarian Museum, King William's Town, South Africa, about the name Liqua River. Mr. Skead stirred up considerable newspaper correspondence regarding the name. The bulk of opinion is that the Liqua (or Likwa or Licua) River is an old native name for the Vaal River, though some opinion is to the effect that it really refers to the Orange River. It seems advisable to restrict the type locality to the vicinity of the junction of the Vaal and the Orange Rivers.

Noctua perlata capensis Schlegel (1862, p. 37) from southern Africa ("Cafrerie" is the locality given) is preoccupied by *Noctua capensis* (= *Glaucidium capense*) of A. Smith, 1834, as well as being a synonym of *Strix licua* Lichtenstein, 1842.

Specimens examined: 8, see range.

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